

## AMENDMENTS TO THE CLAIMS

- 1           1. (Currently Amended) A serial communications system comprising:  
2                   a scrambler for converting original received data into scrambled data; and  
3                   an ECC encoder for converting said scrambled data into ECC-encoded data.
- 1           2. (Original) The system as recited in Claim 1, further comprising:  
2                   a serializer for converting said ECC-encoded data into serialized data;  
3                   wherein the ECC-encoded data includes frame alignment information; and  
4                   the system further comprises a receiver for receiving said serialized data and  
5           converting the serialized data into data frames based upon the frame alignment information.
- 1           3. (Original) The system as recited in Claim 2, wherein the receiver comprises:  
2                   a frame-recoverer for converting said serialized data into data frames;  
3                   an ECC decoder for converting said data frames into ECC-decoded data and  
4           error indications; and  
5                   a scrambler for converting said ECC-decoded data into de-scrambled data.
- 1           4. (Original) The system as recited in Claim 5, wherein said frame-recoverer uses  
2           said error indications in converting said serialized data into data frames.
- 1           5. (Original) The system as recited in Claim 1, wherein said ECC encoder applies an  
2           error correction code in converting said scrambled data into said ECC-encoded data.
- 1           6. (Currently Amended) A serial communications method, comprising the steps of:  
2                   converting original received data into scrambled data; and  
3                   converting said scrambled data into ECC-encoded data.

1           7. (Original) The method as recited in Claim 6, further comprising the steps of:  
2                     generating a serial stream of the ECC-encoded data; and  
3                     transmitting said serial stream.

1           8. (Original) The method of Claim 7, wherein:  
2                     the ECC-encoded data includes frame alignment information; and  
3                     the method further comprises receiving said serialized data and converting  
4     said serialized data into data frames based upon said frame alignment information.

1           9. (Original) The method of Claim 7, further comprising:  
2                     receiving said serialized data;  
3                     converting said serialized data into data frames;  
4                     converting said data frames into ECC-decoded data and error indications; and  
5                     converting said ECC-decoded data into de-scrambled data.

1           10. (Original) The method of Claim 9, wherein the step of converting the serialized  
2     data comprises converting the serialized data into data frames based upon said error  
3     indications.

1           11. (Withdrawn) A serial communications system comprising:  
2                     an ECC decoder for converting data frames into ECC-decoded data; and  
3                     a de-scrambler for converting said ECC-decoded data into de-scrambled data.

1           12. (Withdrawn) The system of Claim 11, further comprising a frame-recoverer for  
2     converting serialized data into said data frames.

1           13. (Withdrawn) The system as recited in Claim 12, wherein:  
2                     said ECC decoder generates error indications; and

3                   said frame-recoverer uses said error indications in converting said serialized  
4 data into said data frames.

1           14. (Withdrawn) The system as recited in Claim 13, wherein said frame-recoverer  
2 generates a frame clock that is shifted in phase based upon said error indications, said frame-  
3 recoverer converting said serialized data into said data frames using said frame clock.

1           15. (Withdrawn) The system as recited in Claim 14, wherein said frame-recoverer  
2 shifts in phase said frame clock by a predetermined number of periods of a bit clock based  
3 upon said error indications.

1           16. (Withdrawn) The system as recited in Claim 13, wherein said frame-recoverer  
2 comprises:

3                   a plurality of registers, each register being controlled to receive said serialized  
4 data and form two or more frames of parallel data therefrom;

5                   a selection control circuit for receiving said error indications and generating at  
6 least one control signal; and

7                   selection circuitry coupled to receive as inputs the output of said registers and  
8 said control signal from said selection control circuit, and output a set of parallel data  
9 appearing at the input of said selection circuitry, said number of bits in said set of parallel  
10 data corresponding to the number of bits in a frame of data.

1           17. (Withdrawn) The system as recited in claim 16, wherein

2                   the selection circuitry comprises a plurality of individual multiplexer circuits,  
3 the number of multiplexer circuits corresponding to the number of bits  $n$  in a frame of data,  
4 each multiplexer circuit being an  $n+1:1$  multiplexer circuit.

1           18. (Withdrawn) The system as recited in Claim 13, wherein said error indications  
2 are associated with errors in said data frames, said ECC-decoder correcting some of said  
3 errors.

1           19. (Withdrawn) A serial communications system comprising:  
2                   an ECC decoder for converting data frames into ECC-decoded data and error  
3 indications; and  
4                   a frame recoverer for converting serialized data into said data frames using  
5 said error indications.

1           20. (Withdrawn) The system as recited in Claim 19, wherein said frame-recoverer  
2 generates a frame clock that is shifted in phase based upon said error indications and converts  
3 said serialized data into said data frames using said frame clock.

4           21. (Withdrawn) The system as recited in Claim 20, wherein said frame-recoverer  
5 shifts in phase said frame clock by a predetermined number of periods of a bit clock based  
6 upon said error indications.

1           22. (Withdrawn) The system as recited in Claim 19, wherein said frame-recoverer  
2 comprises:  
3                   a plurality of registers, each register being controlled to receive said serialized  
4 data and form two or more frames of parallel data therefrom;  
5                   a selection control circuit for receiving said error indications and generating at  
6 least one control signal; and  
7                   selection circuitry coupled to receive as inputs the output of said registers and  
8 said control signal from said selection control circuit, and output a set of parallel data

9 appearing at the input of said selection circuitry, the number of bits in said parallel set of data  
10 corresponding to the number of bits in a frame of data.

1 23. (Withdrawn) The system as recited in claim 22, wherein  
2 the selection circuitry comprises a plurality of individual multiplexer circuits,  
3 the number of multiplexer circuits corresponding to the number of bits  $n$  in a frame of data,  
4 each multiplexer circuit being an  $n+1:1$  multiplexer circuit.

5 24. (Withdrawn) The system as recited in Claim 19, wherein said error indications  
6 are associated with errors in said data frames, said ECC-decoder correcting some of said  
7 errors.

1 25. (Withdrawn) The system as recited in claim 19, further comprising:  
2 a de-scrambler for converting said ECC-decoded data into de-scrambled data.

1 26. (Original) A serial communications method comprising:  
2 converting serialized data into data frames as a function of error indications;  
3 and  
4 converting said data frames into ECC-decoded data and said error indications.

1 27. (Withdrawn) The method as recited in Claim 26, further comprising:  
2 de-scrambling said ECC-decoded data into de-scrambled data.

1 28. (Withdrawn) The method as recited in Claim 26, wherein the step of converting  
2 said serialized data comprises:  
3 generating a frame clock that is shifted in phase based upon said error  
4 indications; and  
5 converting said serialized data into said data frames using said frame clock.



1           29. (Withdrawn) The method as recited in claim 26, wherein the step of converting  
2 said serialized data comprises:

3                   temporarily maintaining bits of said serialized data sufficient to form two or  
4 more frames of parallel bits;

5                   selecting a frame of data from said maintained bits based upon said error  
6 indications, said frame of data being a frame of data in the data frames; and

7                   repeating said steps of temporarily maintaining and selecting for generating  
8 each data frame from said serialized data.

1           30. (Withdrawn) The method as recited in claim 26, further comprising:

2                   initially scrambling received data into scrambled data;

3                   converting said scrambled data into ECC-encoded data; and

4                   converting said ECC-encoded data into said serialized data.

1           31. (Withdrawn) A serial communications method comprising:

2                   converting data frames into ECC-decoded data and error indications; and

3                   de-scrambling said ECC-decoded data into de-scrambled data.

1           32. (Withdrawn) The method as recited in Claim 31, further comprising:

2                   initially converting serialized data into said data frames as a function of said  
3 error indications.

1           33. (Withdrawn) The method as recited in claim 31, further comprising:

2                   initially scrambling received data into scrambled data; and

3                   performing an ECC encoding operation on said scrambled data to generate said  
4 data frames.

- 1                    34.    (New) A serial communication system comprising:
- 2                    a scrambler for converting received data into scrambled data, said received data
- 3    being without redundant bits inserted by said serial communication system; and
- 4                    an ECC encoder for converting said scrambled data into ECC-encoded data.